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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,888	09/12/2003	Mohamad El-Batal	LSI.81US01 (03-1078)	6950
24319	7590	06/25/2007	EXAMINER	
LSI CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035			CHERY, MARDOCHEE	
			ART UNIT	PAPER NUMBER
			2188	
			MAIL DATE	DELIVERY MODE
			06/25/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/660,888	EL-BATAL ET AL.	
	Examiner	Art Unit	
	Mardochee Chery	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 11, 2007 has been entered.

### ***Response to Amendment***

2. Claims 1-24 remain pending.

### ***Response to Arguments***

3. Applicant's arguments filed June 11, 2007 (See remarks pages 6-11) have been fully considered but they are not persuasive.

a. Applicants argue on page 8 of the remarks that "the present claimed invention does not create a delta file by comparing two existing, already stored files and identifying the modified portions for a backed up file, as suggested by Burns. Rather, the delta file of the present invention is recited as: "...storing a record of said changes in said delta log...".

Examiner respectfully disagrees with applicants' contention and would like emphasize that Burns does not disclose "create a delta file by comparing two existing, already stored files" as alleged by applicants. As a matter of fact, there is no disclosure in Burns of such whether in the explicit or implicit. Contrary to applicants' assumption, it is manifest that Burns instead discloses "the file changes from a prior version define what is called a delta file; this delta file compactly represents A2 as a set of changes to A1 (i.e., storing a record of changes associated with A2); col. 5, ll 25 to col. 6, ll 5. Thus, it is evident that Burns clearly discloses "storing a record of said changes in said delta log" of claim 1.

b. Applicants continue to argue on pages 9-10 that Burns has not been properly combined with Rezaul.

i. Examiner respectfully disagrees with such contention. Since Rezaul Islam's and Burns' are in the same filed of endeavor (i.e. data backup, storage and recovery system) as Applicant's invention and are pertinent to the particular problem with which Applicant's was concerned (i.e. data backup and recovery in a storage system), the references can be relied upon as a basis for rejection of the claimed invention and should not be construed as teaching away from one another. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

ii. Additionally, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine the references could be found in Burns, col. 5, ll 55 to col. 6, ll 5 [to achieve an efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable].

c. Applicants argue on pages 10-11 of the remarks that Examiner has used hindsight to construct the present claimed invention.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

d. Applicant's arguments with respect to claim 1 (See remarks filed June 11, 2007, pages 2-5) have been considered but are moot in view of the new ground(s) of rejection.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 6-12, 14-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694) and further in view of Schneider (2002/0049883).

As per claim 1, Rezaul discloses a method for recovering data in a redundant data storage system having a plurality of data storage units, said method comprising: storing said data on said plurality of data storage units according to a redundant data storage method [col.2, lines 18-29]; removing one of said plurality of data storage units [col.4, lines 33-42]; while said one of said plurality of data storage units is removed, changing a portion of said data on the remainder of said plurality of data storage units and [col.4, lines 36-43]; replacing said one of said plurality of data storage units [col.1,

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line 66 to col.2, line 6]; and updating said one of said plurality of data storage units [col.2, lines 18-27].

However, Rezaul does not explicitly teach storing a record of said changes in a delta file and updating those portions of data recorded in said delta file as required by the claim.

Burns discloses storing a record of changes in a delta file and updating portions of data recorded in the delta file [col.5, line 61 to col.6, line 5] in to achieve an efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable (col. 5, ll 55 to col. 6, ll 5).

Since the technology for implementing a storage recovery system with storing a record of changes in a delta file and updating portions of data recorded in the delta file was well known as evidenced by Burns, an artisan would have been motivated to implement this feature in the system of Rezaul in order to achieve an efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul to include storing a record of changes in a delta file and updating portions of data recorded in the delta file because this would have achieved an

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efficient and cost effective backup mechanism to reduce the amount of information sent to a backup server in association with keeping file data consistent and recoverable (col. 5, ll 55 to col. 6, ll 5) as taught by Burns.

However, Rezaul and Burns do not explicitly teach starting a delta log concurrently with said step of removing one of said plurality of data storage units as required.

Schneider discloses starting a delta log concurrently with said step of removing one of said plurality of data storage units [page 40, left column, ll 59-69] to allow saving only data that has been changed since the last backup and thus reducing the backup time required (pars. 14-15).

Since the technology for implementing a storage recovery system with starting a delta log concurrently with said step of removing one of said plurality of data storage units was well known as evidenced by Schneider, an artisan would have been motivated to implement this feature in the system of Rezaul and Burns in order to allow saving only data that has been changed since the last backup and thus reducing the backup time required. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul and Burns to include starting a delta log concurrently with said step of removing one of said plurality of data storage units because this would have allowed saving only data that has been changed since the last backup and thus reducing the backup time required (par. 166, ll 15-19) as taught by Schneider.



As per claims 9 and 17, the rationale in the rejection of claim 1 is herein incorporated. Rezaul further discloses a redundant data storage system capable of fast restoration of serviced data storage units comprising: a plurality of data storage units [col.4, lines 33-44]; and a controller that stores data on said plurality of data storage units according to a redundant data storage method, changes a portion of said data after taking one of said plurality of said data storage units off line, stores a record of the changes in a delta log that are made to the remainder of the plurality of said data storage units, brings said one of said plurality of said data storage units online, and updates said one of said plurality of said data storage units by updating those portions of data recorded in said delta file [Fig.1, controller 120; col.17, lines 46-60].

As per claims 2, 10 and 18, Rezaul discloses the redundant data storage method comprises RAID 1 [col.1, line 66 to col.2, line 15].

As per claims 3, 11 and 19, Rezaul discloses redundant data storage method comprises RAID 3 [col.2, lines 43-57].

As per claims 4, 12 and 20, Rezaul discloses redundant data storage method comprises RAID 5 [col.3, lines 30-45].

As per claims 6, 14 and 22, Rezaul discloses the one of said data storage units comprises a plurality of disk drives [Fig.1].

As per claims 7, 15 and 23, Burns discloses delta file comprises pointers to said portion of said data that is changed Fig.6].

As per claims 8, 16 and 24, Burns discloses the delta file comprises an updated version of the portion of the data that is changed [Fig.8].

6. Claims 5, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rezaul (6,282,670) in view of Burns (6,088,694), Schneider (2005/0149481) as applied to claims 1, 9, and 17 respectively, and further in view of McCabe (2002/0016827).

As per claims 5, 13 and 21, McCabe discloses the redundant data storage method comprises remotely mirroring the data [Fig.3; par.20] in order to provide better fault tolerance and/or disaster recovery (par.2).

Since the technology for implementing a storage recovery system with remote mirroring was well known as evidenced by McCabe, an artisan would have been motivated to implement this feature in the system of Rezaul, Burns and Schneider in order to provide better fault tolerance and/or disaster recovery. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Rezaul, Burns and Schneider to include remote mirroring because

this would have provided better fault tolerance and/pr disaster recovery (par.2) as taught by McCabe.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hesselink 2005/0149481 discloses starting a delta log concurrently with said step of removing one of said plurality of data storage units [par. 166, ll 9-20].

Ofek 6,549,921 discloses starting a delta log concurrently with said step of removing one of said plurality of data storage units and changing a portion of a data on the remainder of the plurality of data storage units during the period when one of said plurality of data storage units is removed [col. 14, ll 39-64; col. 17, ll 60 to col. 18, ll 19].

8. When responding to the office action, Applicant is advised to clearly point out the patentable novelty that he or she thinks the claims present in view of the state of the art disclosed by references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c).

9. When responding to the Office action, Applicant is advised to clearly point out where support, with reference to page, line numbers, and figures, is found for any amendment made to the claims.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571) 272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

June 19, 2007

**Kevin L. Ellis**  
**Primary Examiner**

*Kevin L. Ellis*



Mardochee Chery  
Examiner  
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